

## CLAIMS

1. A catheter having a pre-assembly state and an assembled state, the catheter comprising:

5 a first component and a second component, in the pre-assembly state at least a portion of the first component overlapping at a bonding site at least a portion of the second component, the at least a portion of the first component having a first outer diameter and the at least a portion of the second component having a second outside diameter;

10 in the assembled state the at least a portion of the first outside diameter being substantially equal to the second outside diameter.

2. The catheter of claim 1 wherein the first component defines a catheter shaft.

3. The catheter of claim 2 wherein the second component defines a medical balloon.

15

4. The catheter of claim 3 wherein the second component is selected from the group consisting of medical balloons, sleeves, marker bands, stent retaining hubs and any combination thereof.

20 5. The catheter of claim 1 further comprising a third component, in the pre-assembly state at least a portion of the third component overlapping at the bonding site at least one of the at least a portion of the first component and the at least a portion of the second component, the at least a portion of the third component having a third outer diameter

25 in the assembled state the at least a portion of the third outside diameter being substantially equal to the first outside diameter.

6. The catheter of claim 5 wherein the third component is selected from at least one member of the group consisting of medical balloons, sleeves, marker bands, stent retaining hubs and any combination thereof.

7. The catheter of claim 1 wherein the at least a portion of the first component defines the distal end of a catheter shaft.

5

8. The catheter of claim 1 wherein the at least a portion of the second component defines the proximal end of a medical balloon.

9. The catheter of claim 1 wherein in the assembled state the at least a portion of the  
10 first component is heat fused to the at least a portion of the second component at the bonding site.

10. The catheter of claim 9 further comprising a heat shrinkable band, in the pre-  
assembly state the heat shrinkable band being disposed about the at least a portion of the first  
15 component and the at least a portion of the second component at the bonding site, the heat shrinkable band constructed and arranged to exert a constrictive force on the at least a portion of the first component and the at least a portion of the second component when the bonding site is heated to a predetermined temperature.

11. The catheter of claim 9 wherein the predetermined temperature is the melting point  
20 of at least one of the at least a portion of the first component and the at least a portion of the second component.

12. The catheter of claim 9 wherein the predetermined temperature is about 200 degrees  
25 Celsius to about 325 degrees Celsius.

13. The catheter of claim 9 wherein in the assembled state the heat shrinkable band forces the first thickness and the second thickness together to form the bonding site thickness.

14. The catheter of claim 9 wherein the heat shrinkable band is constructed from at least one polyethylene based material.

15. The catheter of claim 9 wherein the heat shrinkable band is constructed from polyolefin.

16. A catheter comprising:

a first component and a second component, at least a portion of the first component being bonded at a bonding site to at least a portion of the second component, the first component having a first outer diameter and the second component having a second outer diameter, at least the bonding site the first outside diameter and the second outside diameter being substantially equal.

17. A catheter comprising:

a first component and a second component, the first component having a first outer diameter, the second component having a second outer diameter, at least a portion of the first component being bonded to at least a portion of the second component by heat shrinking, when the at least a portion of the first component is bonded to the at least a portion of the second component the first outer diameter is substantially equal to the second outer diameter.

18. A method of bonding at least two components of a catheter together comprising the following steps:

providing a first catheter component and at least one second catheter component, the first catheter component defining a first layer and the at least one second catheter component defining a second layer, the first layer having a first outside diameter and the second layer having a second outside diameter;

overlapping at least a portion of the first layer and at least a portion of the second layer at at least one bonding site;

placing a heat shrinkable band about the at least one bonding site, the heat shrinkable band constructed and arranged to exert a constricting force on the at least a  
5 portion of the first layer and the at least a portion of the second layer at the at least one bonding site when the bonding site is heated to a predetermined temperature;

heating the bonding site to cause the heat shrinkable band to force the overlapping at least a portion of the first layer and the at least a portion of the second layer together to form a single layer wherein the first outer diameter is substantially equal to the  
10 second outer diameter.

19. The method of claim 18 wherein the first component defines a catheter shaft.

20. The method of claim 18 wherein the at least one second component is selected from  
15 at least one member of the group consisting of medical balloons, sleeves, marker bands, stent retaining hubs and any combination thereof.

21. The method of claim 18 wherein the predetermined temperature is the melting point of at least one of the at least a portion of the first component and the at least a portion of the  
20 at least one second component.

22. The method of claim 18 wherein the predetermined temperature is about 200 degrees Celsius to about 325 degrees Celsius.

23. The method of claim 18 wherein the heat shrinkable band is constructed from at least  
25 one polyethylene based material.

24. The method of claim 18 wherein the heat shrinkable band is constructed from polyolefin.